Water Resources Sustainability Project
(WRS)

MARKETING STRATEGY FOR DOKKARAT CHROMIUM RECYCLING PILOT PROJECT

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MARKETING STRATEGY
FOR DOKKARAT CHROMIUM
RECYCLING PILOT PROJECT

Ministère de l'Aménagement du Territoire, de l'Urbanisme
de l'Habitat et de l'Environnement
United States Agency for International Development (USAID)

WRS Project
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Table of Contents

Page

1. Introduction

The goal of the Water Resources Sustainability (WRS) project is to support the Ministry of Environment's (MOE) priority to protect water resources, as outlined MOE's National Strategy for Environmental Protection, and USAID/Morocco's environmental strategic objective to improve water resources management. Much of the focus of the WRS project during the first five years has been to develop and test three pilot projects. One of these was the Dokkarat chromium recycling pilot project, located in Fes.

The city of Fes is an important industrial center in Morocco. Its economic development has unfortunately been accompanied by polluting activities such as from tanneries who five years ago were discharging nearly 600 tons of chromium per year into the sewers of Fes. The effluents discharged by the tanneries and other industries have contaminated the Oued Fes which is released into the Oued Sebou downstream from Fes, thus contributing to make this river one of the most polluted in Morocco.

The city is planning to build a wastewater treatment plant that would not function properly if heavy metals continued to be discharged into the sewer system. Therefore, the WRS project decided to work with the community, tanneries, Fes water utility (RADEEF) and other stakeholders to establish a pilot chromium recycling plant for the tanneries in the industrial area of Dokkarat. This pilot chromium recycling plant serves as a demonstration site for promoting pollution prevention to other tanneries, as well as other industries where recovery methods of pollution apply.

Replicating this project will contribute to testing the provisions of the Water Law 10/95 which focuses on water quality for surface and ground water. The Law states that the organization which pollutes the waterways or ground water is to be held responsible. In the case of Dokkarat tanneries, it would be the Fes water utility (RADEEF) who would be held responsible as it is the organization discharging the treated wastewater into the river. However, water utilities can monitor industries and prevent the discharge of certain pollutants into the utility wastewater collection systems and treatment plants, or they can charge a special fee for the processing these pollutants. Key to replicating recycling projects will be the combination of environmental enforcement along with convincing polluters of the advantages—financial and social—of pollution prevention.

CLIN 7 of the WRS project is to create "a marketing strategy" for handing over to Moroccan organizations the replication of the three pilot projects. This report provides the marketing strategy for the Dokkarat chromium recycling pilot project.

2. Summary of the Dokkarat Chromium Recycling Pilot Project

This industrial pollution prevention pilot project directly contributes to improving environmental technologies in Morocco. The pilot project built a centralized chromium recovery plant that receives the spent tanning effluents from the 16 tanneries in Dokkarat, one of five industrial areas in Fes. In 1997, 12 tanneries in Dokkarat were processing each day 14.25 metric tons of raw hides and consuming 777 m^3 water per day, which contained 88.4 kilograms (kg) of chromium. The chromium concentration in the spent chrome baths was 6,230 parts per million (ppm). This chromium was discharged into the sewer system. The goal of the pilot project is to get the tanneries to adopt chromium recycling technologies and improved management practices leading to pollution prevention.

2.1. The Methodology Used for the Pilot Project

As with the other pilot projects, the design and implementation of this project was built around the following WRS pillars:

- Participation of beneficiaries and stakeholders
- Identification, testing and adoption of appropriate technologies
- Establishing effective institutional partnerships

In 1977, WRS conducted a feasibility study and assessed the operations of the tanneries in Dokkarat. The feasibility study evaluated various options for reduction of chrome in discharged wastewater from the tanneries. The feasibility study identified suitable chrome recycling technologies that would result in cost savings for the targeted tanneries. The selected option was to create a centralized chromium recovery plant. In this project, the tanneries have segregated their chrome-containing wastewater. The wastewater is then transferred from the tanneries to the chrome recovery plant by pipeline.

In 1998, WRS signed a collective agreement with the project's key stakeholders—MOE, the Wilaya of Fes, Agdal Municipality, and RADEEF. The design and specifications for the recycling plant were also completed that year. Also in 1988 the environmental impact assessment was completed, approvals were received from USAID, contracts negotiated for construction of the network and plant, and equipment ordered.

In 1999 the construction of the sewer network was completed and plant construction began. In 2000 the plant building was completed and equipment installed.

In May 2001 the testing of the system began. The plant is currently operational. However, the pipeline network has shown some leaks. The WRS team is in the process of resolving this problem.

2.2. Key Stakeholders Involved

WRS and the Ministry of Environment (MOE) managed the design and construction of this pilot project. The key stakeholders involved in this pilot project were:

- The tanners who separate their effluents, purchase the chromium recovered by the pilot unit, and might pay a fee to help cover the operation and maintenance costs of the chromium recovery unit

- The Wilaya who facilitated the administrative procedures

- The municipality of Agdal who provided the land and the building permit for the recovery system

- RADEEF (the utility in charge of Fez' sanitation) who operates and maintains the chromium recovery system unit

2.3. Results of the Pilot Project

The objective of WRS was to reduce 90% of the chrome in the wastewater discharged by the tanneries in Dokkarat and obtain 100% participation of the tanneries in the recycling program. The feasibility study estimated that the recovery system would achieve the goals of 90% reduction of daily discharge of 88.4 kg to 80 kg of chromium in the wastewater and would reduce the concentration of the chromium from 6,230 ppm to less than 1 ppm. Tests in the project show that the plant itself is removing virtually 100% of the chrome it receives. The remaining 10% comes from within the tanneries where chromium gets into the wastewater that is discharged into the sewer. It is not possible the tanneries to capture 100% of the chromium for recycling.

All of the tanneries in Dokkarat are participating in the project. Therefore the goal of 100% participation has been achieved. The tanneries have, at their cost, installed the equipment and procedures to segregate the chrome-containing wastewater so that it can be sent by pipeline to the recovery plant. During the time of establishing this pilot project two additional tanneries have located at Dokkarat to take advantage of the chromium recycling plant.

In addition to these technical results, this pilot project is introducing several basic concepts into the Moroccan environment program. One is pollution prevention technology which recovers all or a significant amount of the cost of recycling. The second is that the polluter pays a portion of the cost of recycling. These concepts can be demonstrated with the Dokkarat chromium recycling project and are important for replicating the project.

3. Preparing for the Replication Program

From the beginning of the project, the WRS team knew that the experience gained with the pilot projects would serve as the base for replicating them in other areas of Morocco. Therefore, careful records were kept of the process followed as well as what was actually done, what worked and what didn't work. This involved a participatory process with local consultants, stakeholder groups, and ultimate beneficiaries. In the last two years, the WRS team began to prepare for the replication program by carrying out the following activities:

3.1. WRS Dissemination Strategy Paper

In January 2000, the WRS team prepared a dissemination strategy paper which presented an overall framework for designing and implementing the replication process which included:

- **Successful pilot projects as demonstration examples** – Documenting how the pilot projects were created through a participatory approach, using appropriate technology, involving cost recovery, securing institutional partnerships and monitoring the progress. The successful pilot projects would be used as a base for preparing tools and replication manuals on lessons learned, beneficiaries to become advocates to others, technologies shown to work, and demonstration of financial viability.

- **Financing** – Using the pilot projects as demonstrations of financial viability, to encourage public, private and international financial institutions to support replication projects.

- **Training** – Identifying and building capabilities of partner institutions to replicate the pilot projects over the long term.

- **Communication** – Identifying policy makers, influential groups, partner institutions and target beneficiaries to disseminate information about the pilot projects and encourage these groups to replicate the pilot projects in their own settings.

3.2. WRS Communication Strategy and Action Plan

The Communication Strategy for replicating the pilot projects was completed in October 2000. It provided an overall approach for designing and implementing communication programs for replicating the pilot projects including identifying target audience groups, primary communication tasks, and the basic tasks required to successfully implement the strategy.

Once the communication strategy was completed, an Action Plan for Communication Support to the Replication of the Dokkarat Chromium Recycling Pilot Project was prepared. The action plan identified stakeholder groups to involve in the replication process and the actions they needed to take, suggested steps in supporting the replicating program, and recommended what communication programs/materials that needed to be produced.

3.3. Lessons Learned

At the current time the WRS team is in the process of handing over the chromium recovery plant to the plant's operators, RADEEF. This involves monitoring the operations, tracking the expenses, helping tanneries to use recovered chrome and monitoring the concentrations of chrome in the sewer.

The WRS team has prepared operations manuals for the plant. Reference materials for all the equipment have been collected and given to the plant operators. The RADEEF staff who will be operating the plant have been trained.

This pilot project has had a number of technical challenges it had to overcome. It also had strong support from some stakeholders (such as the Wilaya of Fes) and it did not have the strong endorsement and support from others. In May 2001, the WRS team conducted a lessons learned workshop with all the key stakeholders where the process of designing and constructing the plant was reviewed, successes identified, problems discussed and recommended solutions formulated, and recommended changes formulated for replicating this pilot project. A report on the workshop has been prepared. The WRS team and their consultants are now finalizing the lessons learned report which will be made available for groups who want to replicate this chromium recycling plant.

3.4. Guidelines for Establishing New Projects

Building upon the above materials, the WRS team is in the process of producing a guidelines manual which will be used, tested and refined during the replication process, which will take place during the WPM project. The primary user of this guidelines manual will be the organization that will provide the leadership in replicating the Dokkarat Chromium Recycling pilot project.

4. Overall Marketing Approach

To successfully continue the replication program over the long-term a single organization needs to be identified who will carry out the functions that were performed by the WRS team. In other words, be the "engine" which drives the replication process. This organization will be the "champion" of pollution prevention and clean technologies, the "facilitator" to get industries and key stakeholder groups committed to implementing these programs, and the "dealmaker" to put together the financial package and technical support required to successfully implement industrial wastewater recycling programs.

Unlike the other pilot projects, replicating this one is going to be more complex. There are three factors which can contribute to adoption of pollution prevention technologies in Morocco:

4.1. Enforcement of the Water Law

The Water Law 10/95 requires the establishment of "norms and standards" for industrial wastewater effluents to apply the polluter pays principle. This needs to be followed up by enforcement. The Law provides the framework to carry out the enforcement activities which are needed to encourage industries to adopt pollution prevention technologies and management practices which will result in reduction of water pollution. This will involve the Ministry of Environment, Ministry of Equipment, Ministry of Commerce and Industry and other ministries who establish the norms and standards, and enforcement them.

4.2. Pollution Prevention Pays

"Pollution prevention is profitable" applies only to some industries, but not all. Pollution prevention does, however, reduce the cost of treatment, which is an advantage to the companies when enforcement is employed. In the case of chromium recycling, the sale of recycled chrome to the tanneries doesn't recover the full cost of treatment and is not necessarily financially beneficial to the tanneries. Other industries – such as paper wood pulp processing – recycling can be profitable to the company.

4.3. Export Environmental Requirements

Introducing pollution prevention is generally most difficult with companies that are producing for the local market. In many industries, the companies who are exporting to Europe, United States or other regions face strict environmental requirements. In these cases, the importing countries are contributing to the enforcement function. And, in many cases, these companies are larger with more resources available and tend to have more enlightened management. The third group of industries are the multinationals. They are generally early adopters of pollution prevention technologies and management procedures. Therefore, they can become models for locally owned companies to follow.

Given the above factors, this marketing strategy will work with an facilitator/dealmaker organization which can:

- Work with the Government of Morocco (GOM) agencies to prepare the "norms and standards" for the Water Law and encourage the enforcement of the Law.

- Identify industries where pollution prevention is profitable and help them establish these programs.

- Work with industries that are already exporting or want to export goods to countries with strict environmental regulations, and help them to install the pollution prevention technologies and management procedures required.

- Work with private companies instead of public sector companies which are dependent on government financial allocations for installing pollution prevention equipment and are less receptive to profit incentives.

The group identified that could carry forward these functions is the Moroccan Center for Clean Production (Centre Marocain de Production Propre—CMPP) which is located in Casablanca. This Center is the leading advocate for pollution prevention and clean technologies in Morocco. It has developed working relations with Moroccan industries, GOM agencies, and donor agencies. It is associated with UNIDO (who can provide technical and managerial guidelines for various industries) and UNEP (who can share environmental standards and access to a wide range of other environmentally related information). The Swiss Government has provided support to the Center.

The Ministry of Environment (MOE) has been the primary partner to the WRS project and has a lot of talented staff who can contribute much to the replication program. They also have a good working relationship with CMPP. Therefore, it is envisioned that MOE will be involved with CMPP replicating the Dokkarat pollution prevention project. MOE will in this case have special roles related to environmental assessments, monitoring pollution, and providing special technical advice. CMPP should draw upon MOE staff who worked on the Dokkarat pilot project with WRS. It is expected that MOE will be an advocate as well as providing technical support to the replicated projects. CMPP could be well advised to establish some type of advisory board which would include MOE, Ministry of Commerce and Industry, financial institutions and other key stakeholders who would provide advice on and support to new potential replicated projects.

5. Recommended Organizational Structure for Marketing the Dokkarat Chromium Recycling Pilot Project

The experience from the WRS project showed that a number of stakeholder groups had to be brought together, including the beneficiaries, to successfully design and implement an industrial pollution prevention program. The following is a summary of the groups who will have to be involved in this marketing program. The specific organizations will vary by each replicated project, but these types of groups will have to be involved:

5.1. Catalyst/Dealmaker

In selecting the "engine" for the replication program the following characteristics of the organization were considered important:

- **Entrepreneurial** – The organization should be private or autonomous with a desire and ability to sell or market its services to others for pay.

- **Flexible** – It is important that the organization not be tied down with many bureaucratic constraints.

- **Quick Response** – The organization should be able to identify and respond quickly to opportunities in replicating the pilot pilots and putting together "deals."

- **Dedicated to the Program/Technology** – The staff of the organization should be motivated and technically qualified to promote the replication program and the technologies involved.

- **Strong Management** – The funding agencies, especially, will be looking for a well managed organization that can identify and move forward replication projects, prepare proposals and budgets, oversee effective implementation, and provide the required reporting.

The Moroccan Center for Clean Production (CMPP) appears to be especially well suited to be the "engine for carrying out the replication program for the Dokkarat chromium recycling pilot project.". CMPP is familiar with the Dokkarat pilot project and the WRS project. Being an NGO, CMPP seems to be well placed to link public and private sector agencies. It also has access to UNIDO and UNEP resources and through them possibly to funding agencies. The WRS team will have to begin discussions with CMPP to assess their interest and capabilities to carry out this work.

5.2. Local Leaders/Advocates

There are a variety of advocates for pollution prevention projects. This includes Wilayas and municipal governments, industry associations and chambers, NGOs, and other groups who are concerned with cleaning up the environment by reducing industrial pollution. The local water utility will also have to be heavily involved and in some cases may have to operate centrally operated recycling plants and in other cases will monitor the effluent discharge from industries.

5.3. Financial Inputs

Depending upon the specific pollution prevention setting, the financial arrangements could greatly vary. The concerned companies will certainly have to contribute to the project either by building the pollution technology into their plant or contributing to a central plant. In some cases the municipality and/or water utility will have to contribute as the pollution prevention program will be cheaper than doing the clean up through their wastewater treatment facilities. There will also be cases where parastatals, government agencies, private banks or international donor agencies will need to fund portions of the project. They may be motivated by social and environmental concerns and contributing to the well fare of the community.

5.4. Technical Inputs

The technical inputs will vary according to the specific pollution prevention program. However, the CMPP will have technical information to make available to industries and other stakeholder groups. The MOE can provide technical inputs such as conducting environmental audits. Other government agencies can also contribute to these projects. In some cases consulting firms—internal and external—may be needed to conduct feasibility studies, prepare specifications for equipment, install equipment, train staff, etc. Equipment suppliers can also provide technical inputs on installing equipment and O&M practices.

5.5. Target Industries

The WPM team will work with CMPP and other stakeholders to identify priority industries. There has already been some companies who have expressed interest in replicating the pollution prevention experience from Dokkarat. They include tanneries in other locations and a dairy processing plant in Souss-Massa. These will have to be selected based upon the impact upon the environment, financial feasibility, and interest among the stakeholder groups.

5.6. Role for WPM

As part of implementing this marketing strategy, the WPM team will perform a different role than under WRS. Under WRS, the project team performed the catalyst and dealmaker roles. Under the WPM project the team will provide assistance to CMPP to become effective as a catalyst and dealmaker in the pollution prevention field.

During the WRS project, the team utilized the “process consultation model” of guiding stakeholder groups through the decision making process of identifying, designing, implementing and monitoring results of the pilot projects. Now, the WPM team will focus the process consultation model on the CMPP team who in turn will integrate this management consulting model into their program for working with the stakeholder groups. The goal is that at the end of the WPM project CMPP will be capable of identifying projects, enlisting the required stakeholders, putting together financial packages, managing the implementation, monitoring results and reporting results to stakeholder groups, especially the funding agencies. The marketing process for industrial pollution prevention will be transferred to the Moroccan Center for Clean Production (CMPP) to continue in the future.

The priority for WPM will be identifying industries in the Souss-Massa region where the pollution prevention projects can be replicated. However, the WPM team can provide assistance to CMPP to build up their capabilities in the pollution prevention field throughout the country.

6. Support to the Marketing Program

While the WPM team will take on a new role in replicating the Dokkarat chromium recycling pilot project, they will continue to support the involved organizations.

6.1. To the Moroccan Center for Clean Production (CMPP)

The WPM team will serve as partners to CMPP. Since CMPP is an on-going operation the first step will be to learn more about their program and capabilities. The outcome of this review will be a plan for what CMPP can do and where they might need technical and other assistance from WPM and other groups to build the required capabilities and capacities. As time permits, the WPM team will backstop CMPP in identifying at least one new industrial recycling project and provide assistance to them in implementing it.

6.2. To the Replication Institutional System

In this new phase, the WPM will have direct contact, along with CMPP, with the stakeholder groups in the Souss-Massa region that they had with the Dokkarat chromium recycling pilot project. However, in other regions WPM will working primarily through CMPP with these stakeholder groups. The approach will be to help CMPP to learn and adapt the process to their program which WRS developed in creating the Dokkarat chromium recycling pilot project so that CMPP can continue the replication process successfully in the future for a wide variety of pollution prevention programs.

7. Action Plan

The following are the recommended steps which the WPM team and MOE staff working in partnership with the Moroccan Center for Clean Production (CMPP) should carry out:

7.1. Establish a Formal Agreement with CMPP

Since CMPP is an on-going organization and has not been formally involved in the WRS program, there will need to be a series of discussions with them exploring how they can take over the leadership in promoting pollution prevention technologies. This should result in a formal agreement between CMPP and WPM as to what each will do and what types of outside assistance may be needed by CMPP. The MOE will be involved in these discussions as it is the primary GOM agency concerned with industrial pollution monitoring and promoting its prevention.

7.2. Develop a Pollution Prevention Action Plan for the CMPP

The WRS/WPM team will share with CMPP where there are opportunities for replicating the Dokkarat chromium recycling project and other pollution prevention opportunities. This will include information on industries, locations, stakeholders, funding possibilities, other inputs needed, and a schedule for follow up action. This plan should state the roles CMPP will perform, types of services it will provide, any fees it might charge, and what information clients and funding agencies should have. The CMPP will have to decide if it should establish a pollution prevention advisory board, if they do not already have one, to provide advice and assistance in developing pollution prevention projects. The role of MOE supporting CMPP will also be identified in the action plan.

7.3. Institutional Development Plan

As part of the WPM review with CMPP, an institutional needs assessment should be conducted to determine if some institutional strengthening is needed to carry out this program. If appropriate, a management/institutional development specialist might be used to assist in doing the assessment and preparing the institutional development plan. The assessment should also look at the CMPP management and financial procedures in terms of working with various funding and donor agencies. The institutional development plan should spell out any additional staff needed, staff training, facilities expansion, equipment and supplies, transport and other resources CMPP might need. Once the institutional development plan is prepared, the WPM team should help CMPP develop proposals for submitting to appropriate funding agencies to implement the plan. MOE will also be asked to provide assistance to strengthening CMPPs capabilities.

7.4. Strengthen Management, Financial and Reporting Procedures for CMPP

The institutional development plan will indicate if there is a need for CMPP to strengthen their management, financial and reporting procedures, especially for working with funding and donor agencies. USAID and other donor agencies might be able to provide assistance to CMPP for these institutional strengthening activities.

7.5. Conduct Team Building and Other Staff Training

The institutional development plan will also indicate if there are team building or staff training needs. If so, the WPM team should help CMPP prepare training plans and secure funding for these activities. It is also suggested that CMPP be invited to a meeting with all the stakeholders of the Dokkarat chromium recycling pilot project to review the process followed, what was done, what worked well, what didn't work and formulate how the replication can be easier and more effective. CMPP should also be full participants in preparing the lessons learned report and the guidelines for replicating the Dokkarat pilot project. This would provide the CMPP staff a good understanding of how WRS guided the design, installation, operation and monitoring of the Dokkarat chromium recycling plant.

7.6. The CMPP Produce Promotional/Marketing Materials

The WPM should provide assistance to CMPP to develop promotional materials which it can use in its facilitation/dealmaker role. These should supplement and add to the promotional materials CMPP has already produced. In the early days there should probably be a flier/brochure describing CMPP and its services in the industrial pollution field. There should also be a PowerPoint presentation with the same information which can be shown through a computer projector to large groups and as flip cards to small groups or individuals. As the program progresses, it will be important for CMPP to develop success story case studies. These case studies could be brochures and poster displays.

7.7. Establish Working Relationships with Clients, Partners and Financial Institutions

CMPP already has a network of contacts in industry, associations and government. These should be reviewed and it be determined if there are gaps which the WPM can help in establishing contacts. One contact could be with USAID and other donors. Another may be with the Ministry of Environment and other governmental agencies. This will be part of the "helping role" WPM will provide CMPP.

7.8. Support First Replication Project

If CMPP uses one of the WRS/WPM projects, especially in the Souss-Massa region, as a replication project then the WPM team should provide any assistance needed. This could include helping establish contacts with stakeholders, designing feasibility studies, developing proposals for financial packages, reporting procedures, etc.

7.9. Evaluate First Replication Project and Modify the CMPP Pollution Prevention Action Plan

If the WPM team provides CMPP assistance for the first replication project, once the project is launched there should be a joint review meeting to evaluate the process. Based upon this review, CMPP may want to modify its procedures and action plan. It may also request additional technical assistance for strengthening its capabilities to carry out this replication program, which the WPM team can help CMPP approach donors for the funds.

7.10. Monitor On-Going Replication Program

Throughout the life of the WPM, the team should maintain contact with CMPP, maybe with quarterly meetings, to review progress they are making, problems encountered and identifying any needs for addition assistance they may have.

7.11. End-of-Project Reporting

At the end of the WPM project a report should be prepared on the handling over of the industrial pollution prevention program to CMPP. This should contain any lessons learned and areas where CMPP may need additional assistance in the future.